DEFENSE THREAT REDUCTION AGENCY

DTRA

Making the World Safer

S&T Component of the Chemical-Biological Defense Program

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DTRA/CB

USSOCOM
2 Dec 03

Using a full spectrum of tools to reduce the present threat and prepare for future threats

Arms Control:

Inspecting threats and stopping them at national borders

Threat Reduction:

Dismantling the former Soviet nuclear arsenal in place and eliminating Iraqi weapons of mass destruction

Technology Development:

Developing, testing and fielding offensive and defensive technologies

Chemical and Biological Defense:

Assuring operations in hostile environments

Combat Support:

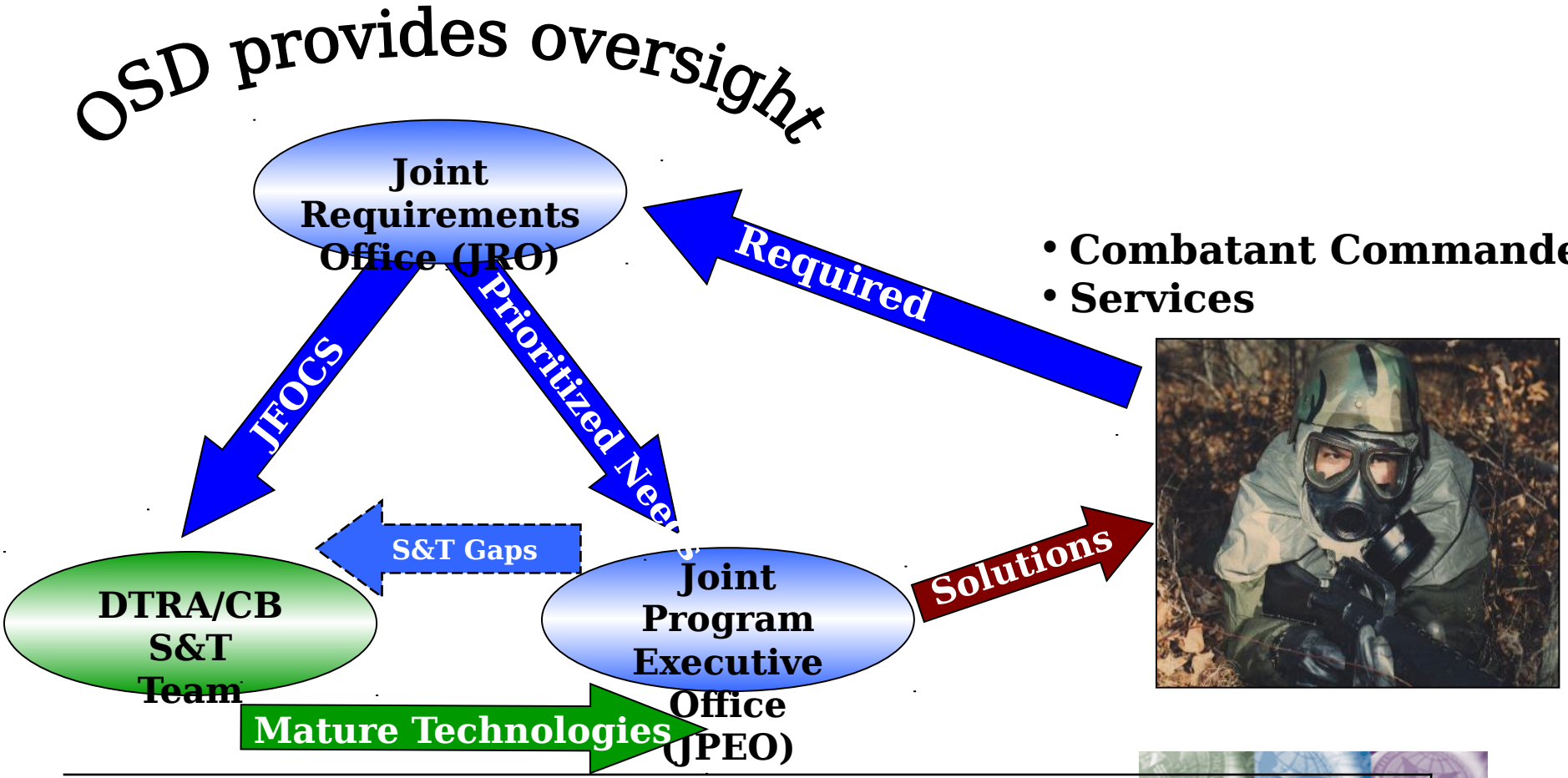
Assessing vulnerabilities, assuring the nuclear deterrent

Making the World Safer

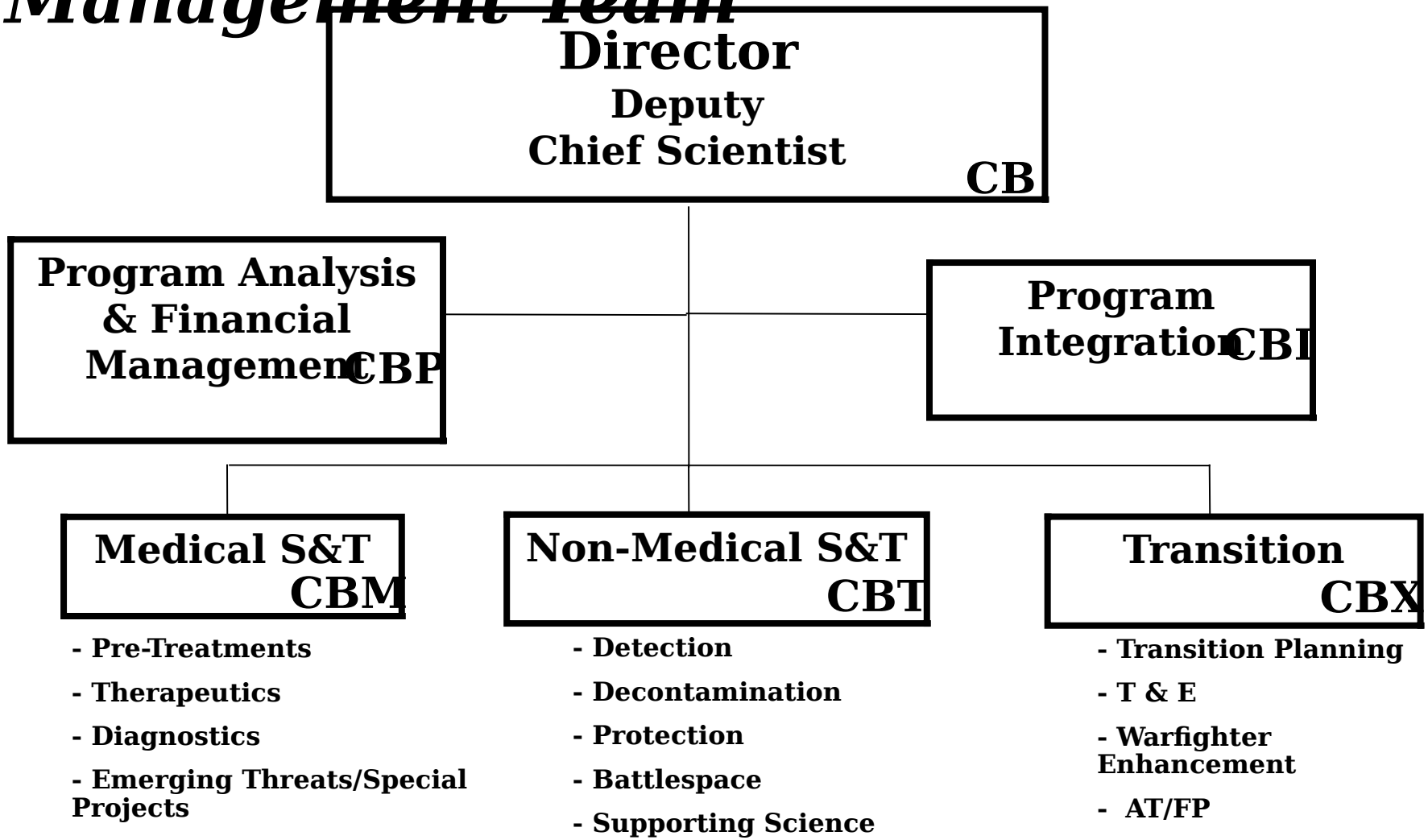
The CB threat is changing

- **Warfighter – during conflict**
  - **Traditional**
  - **Emerging**
- **Expanded to include terrorism**
  - **DoD facilities**
  - **Homeland Defense**

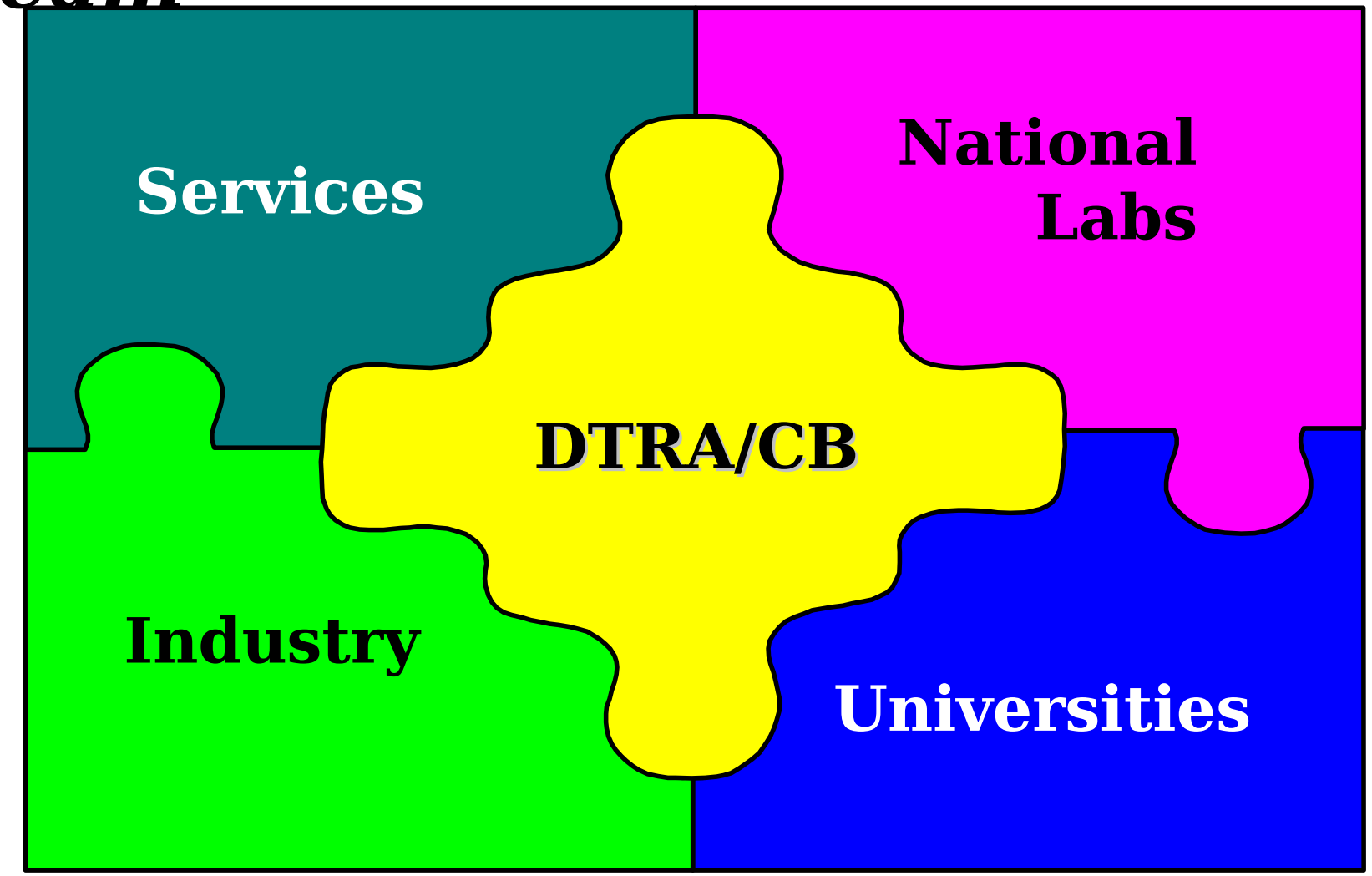
S&T team is an integral member of the CBDP team



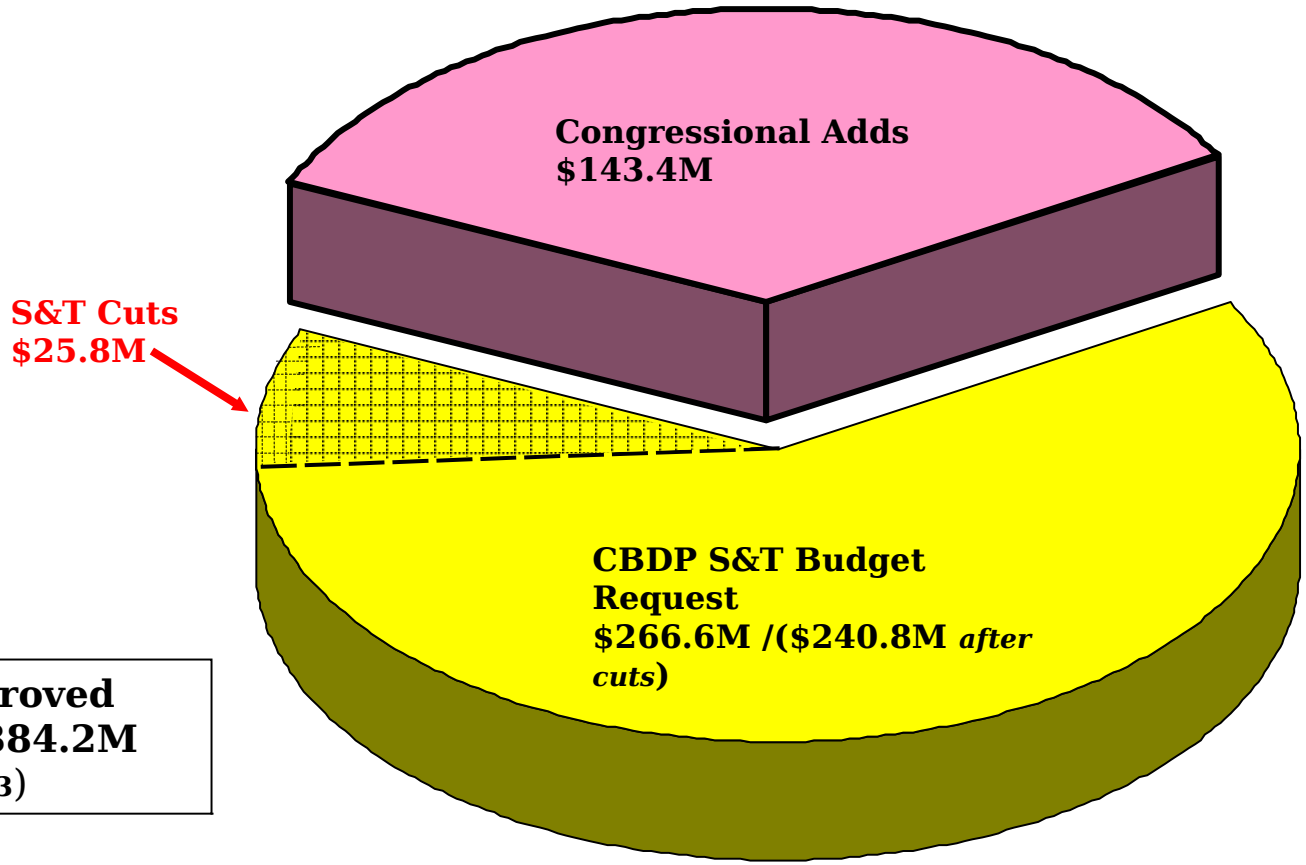
Chemical and Biological S&T Management Team



CB S&T Execution Team

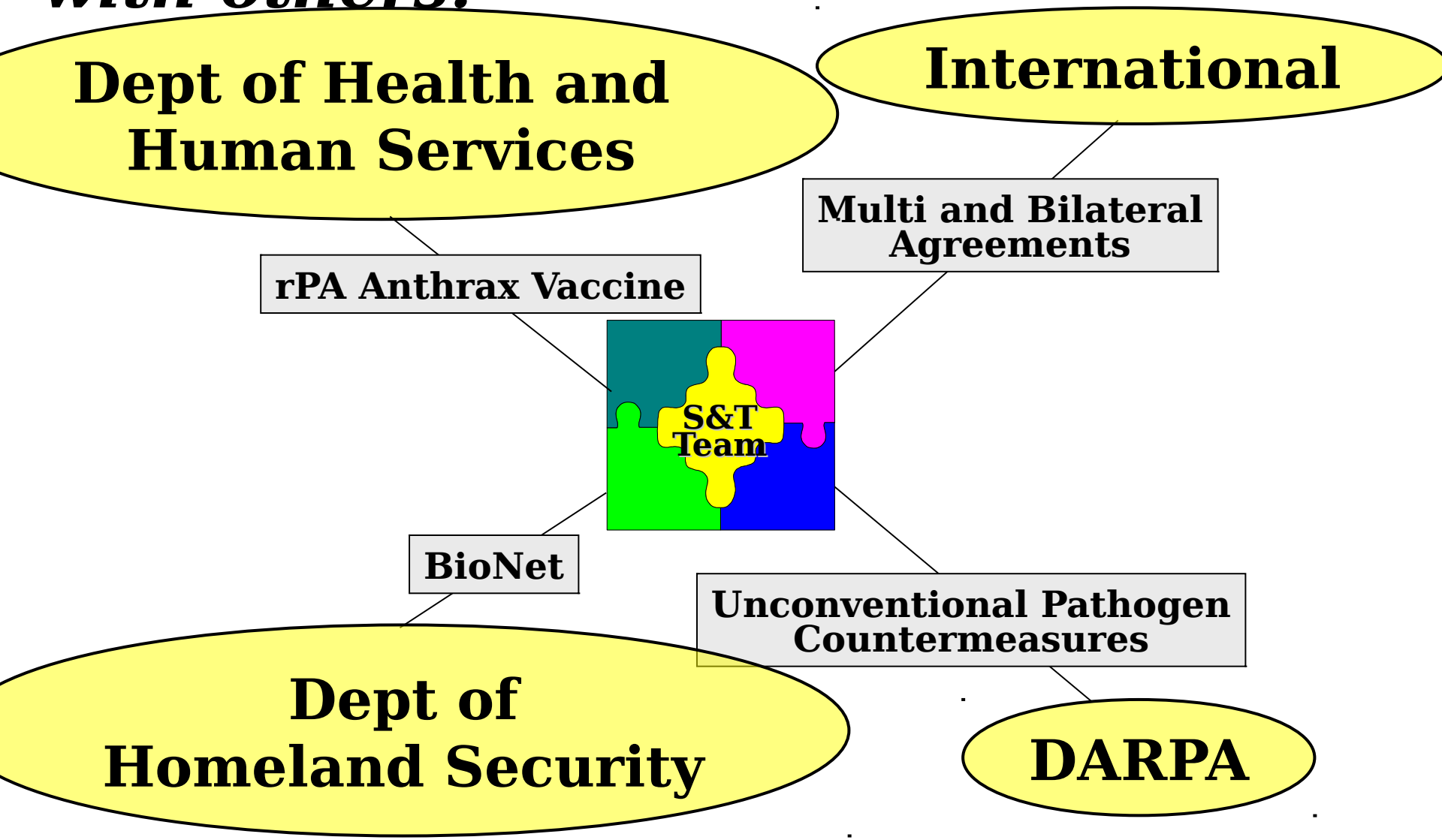


' is making a large investment in S&T in

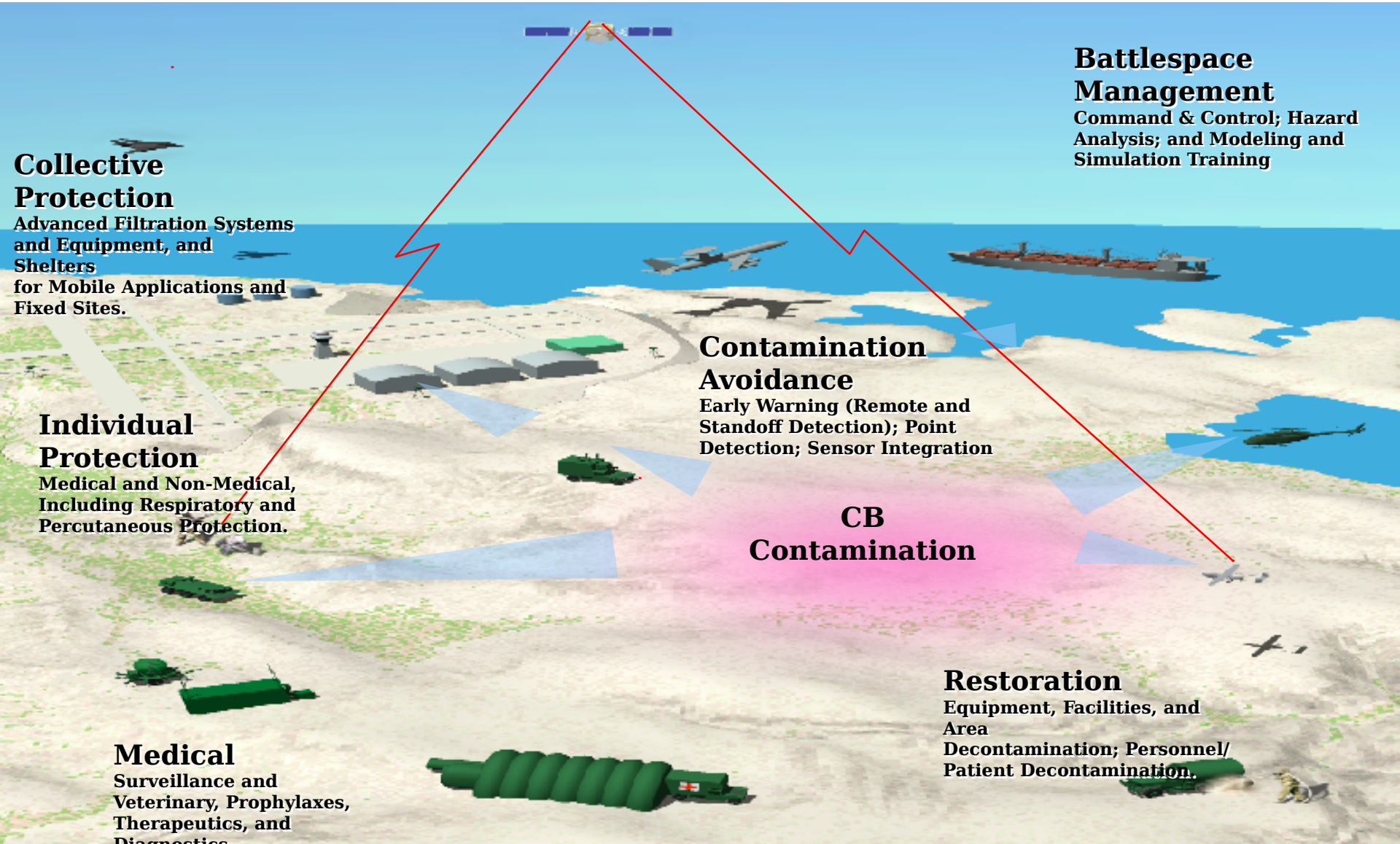


FY04 Approved Budget: $384.2M
(9/24/03)

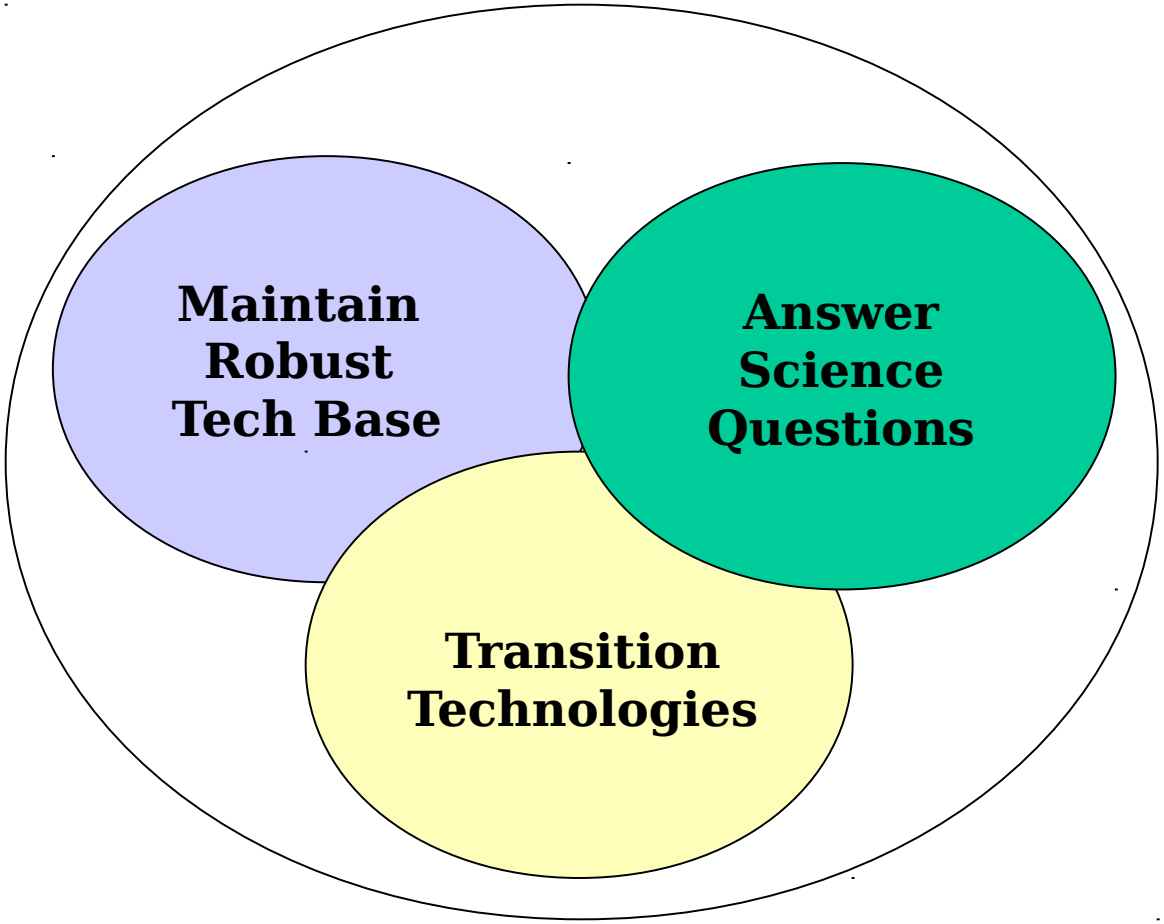
We are collaborating and cooperating with others.



CB Defense is a System of Systems


Battlespace Management
Command & Control; Hazard Analysis; and Modeling and Simulation Training
Collective Protection
Advanced Filtration Systems and Equipment, and Shelters for Mobile Applications and Fixed Sites.
Contamination Avoidance
Early Warning (Remote and Standoff Detection); Point Detection; Sensor Integration
Individual Protection
Medical and Non-Medical, Including Respiratory and Percutaneous Protection.
CB Contamination
Restoration
Equipment, Facilities, and Area Decontamination; Personnel/ Patient Decontamination.
Medical
Surveillance and Veterinary, Prophylaxes, Therapeutics, and

S&T Efforts


Maintain
Robust
Tech Base
Answer
Science
Questions
Transition
Technologies

CB S&T will be an integrated program

Medical S&T

Non-Medical S&T

Maintain Robust Tech Base

Answer Science Questions

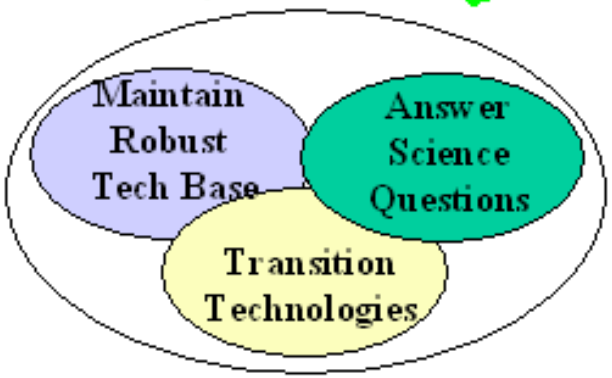
Transition Technologies

TRANSITION

Medical S&T Efforts

Pretreatments & Prophylaxes

Diagnostics



Therapeutics

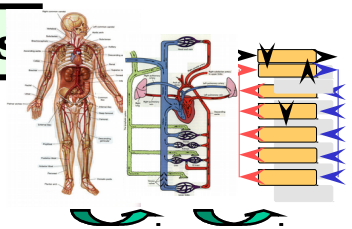
Provide medical solutions for military requirements to sustain and protect the force in CB environment

Low-level chemical warfare agent research will support operational risk management decisions

Medical portion of this joint medical/non-medical research effort will explore the potential for transient or sustained systemic toxicity of low dose exposure(s) to CWAs and predict human morbidity.

Inhalation Studies

ECBC



Health Effects

USAMRICD

Three Major Thrusts

Integration Studies

One Product

Science-Based Exposure Standards for Deployed Forces

- **Detector limits & materiel requirements**
- **How "dirty" is clean enough?**
- **Diagnostics and therapeutics**

Studies include:

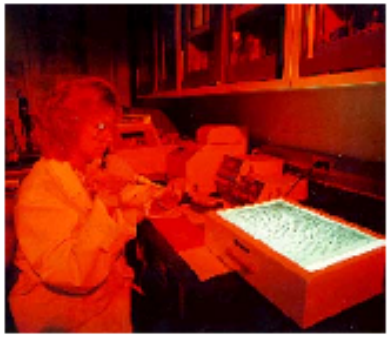
- **Behavioral and neurological consequences of exposure to CWAs**
- **Conc-Time Profiles**
- **Biomarkers**
- **Route/Species Extrapolation**

DTRA

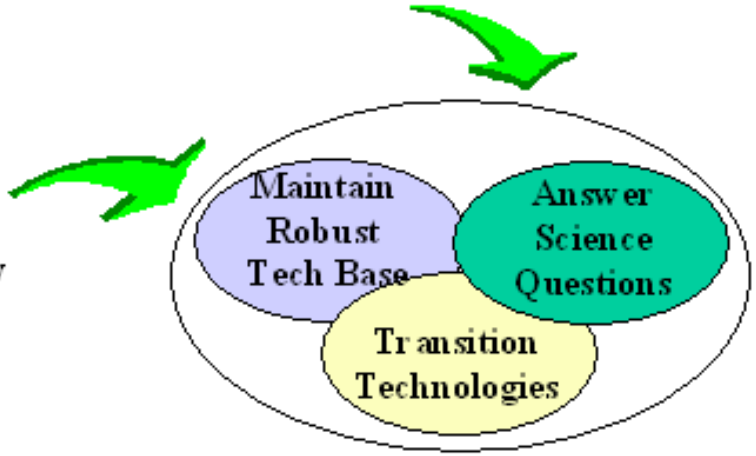
Making the World Safer

Non-Medical S&T business area

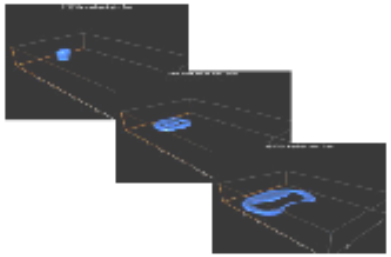
Detection



Supporting Science & Technology



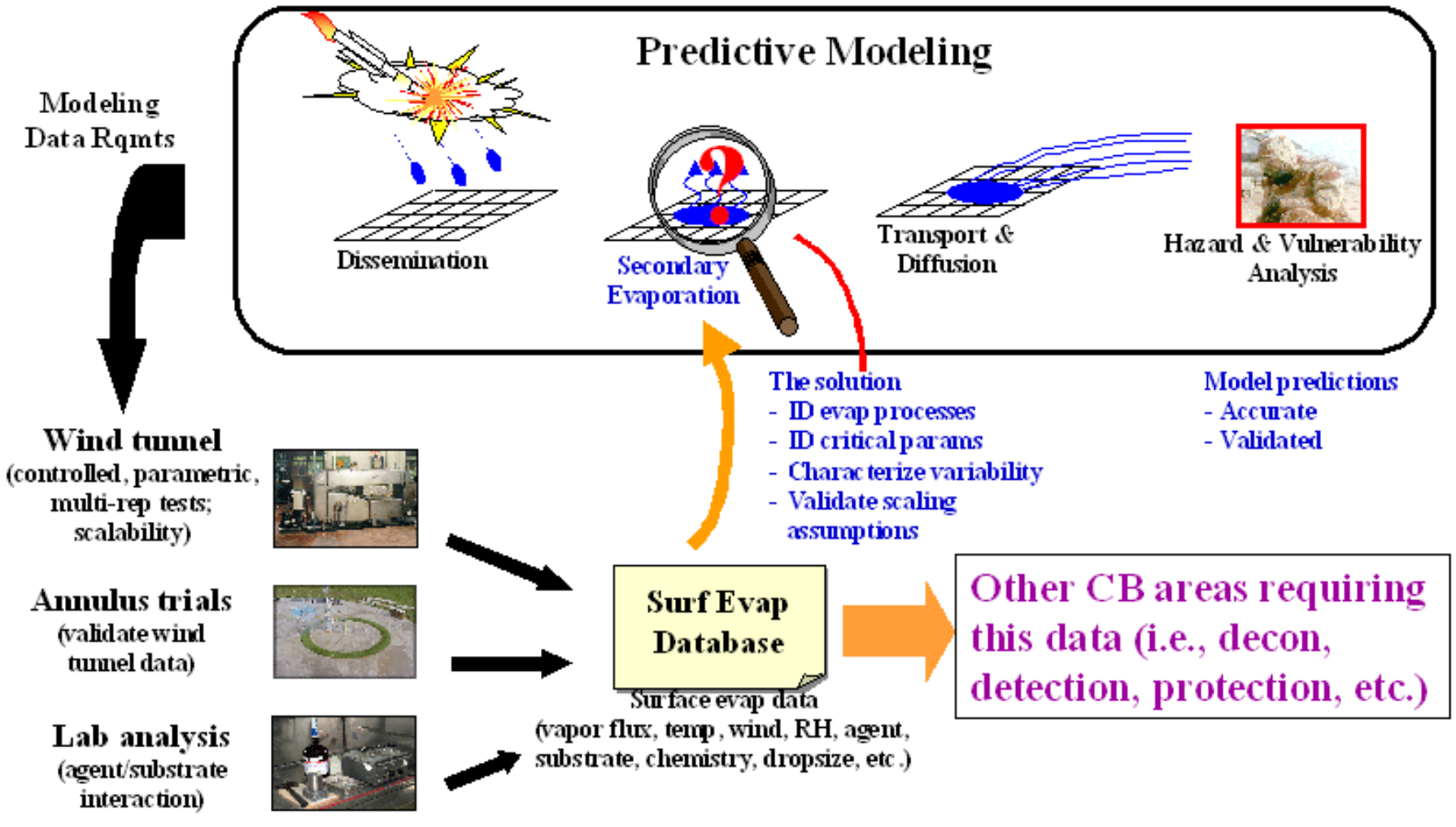
Protection



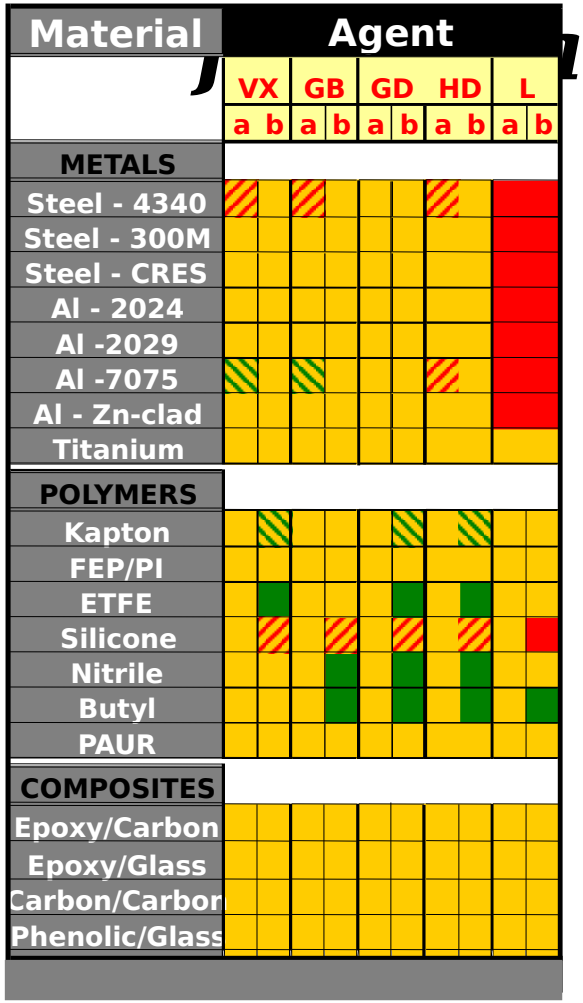
Modeling & Simulation

Decontamination

Agent Fate


Predictive Modeling
Modeling Data Rqmts
Dissemination
Secondary Evaporation
Transport & Diffusion
Hazard & Vulnerability Analysis
The solution
- ID evap processes
- ID critical params
- Characterize variability
- Validate scaling assumptions
Model predictions
- Accurate
- Validated
Wind tunnel
(controlled, parametric, multi-rep tests; scalability)
Annulus trials
(validate wind tunnel data)
Lab analysis
(agent/substrate interaction)
Surf Evap Database
Surface evap data
(vapor flux, temp, wind, RH, agent, substrate, chemistry, dropsize, etc.)
Other CB areas requiring this data (i.e., decon, detection, protection, etc.)

Agent/Materials Compatibility has been neglected



- Data was very limited
- Evaluation is somewhat subjective
- Does not address materials used in modern aircraft
- Neglects the impurities to be found in weapons grade agents which may be a source of acids
- Large number of yellow blocks in the matrix shows need for additional data collection and analytical effort

We will transition products out of S&T

Medical S&T

Non-Medical S&T

Evaluate Mature Technologies

Integrate with the Acquisition Process

Meet the Operator's Needs

TRANSITION

We conduct high visibility demonstration projects for the warfighter

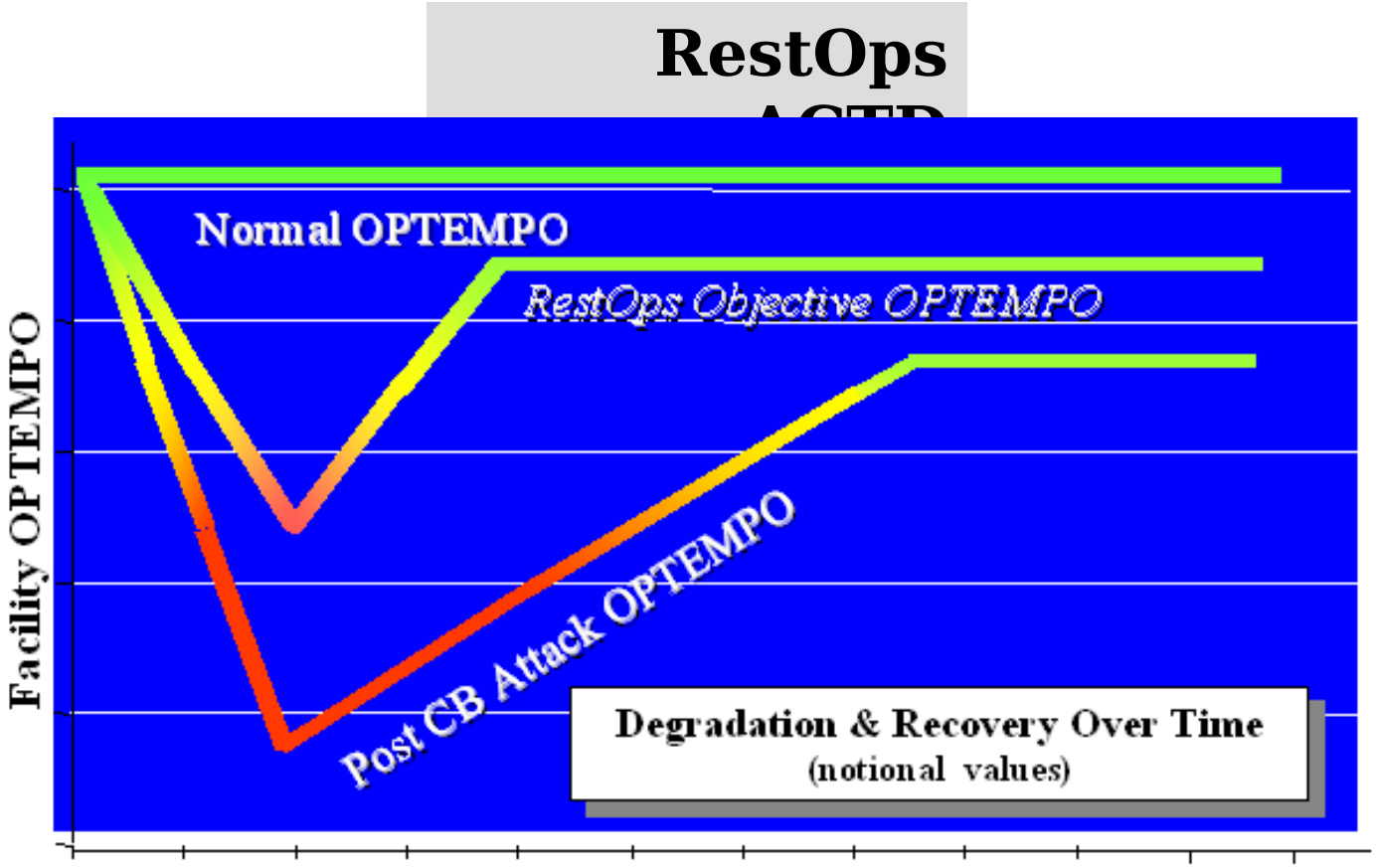
Large Frame Aircraft Decon Demonstration (LFADD)

Restoration of Operations (RestOps)

Contamination Avoidance of Sea Ports of Debarkation (CASPOD)

Joint Service Installation Pilot Project (JSIPP)

Installation Protection Programs



- Demo tools & technologies to mitigate effects of CB attack on fixed sites
- Demo Ops Concepts and Tactics/Techniques/Procedures (TTPs)
- Incorporate lessons learned into Joint/Service doctrine
- Identify policy implications

RestOps Technologies

SITUATIONAL AWARENESS

CHEMICAL & BIOLOGICAL AGENT DETECTION

PROTECTION

BIOLOGICAL AGENT IDENTIFICATION

DECONTAMINATION

Large Frame Aircraft Decontamination Demonstration (LFADD)

OBJECTIVES

- Determine the *removal efficiencies*
- Determine *time required*
- Determine *logistic burden*
- Evaluate the *utility of new detection and sampling* technologies

Decontamination of aircraft is integral to CONOPS

Large Frame Aircraft Decontamination Demonstration (LFADD) Concept

- **Use current Concept of Operations (CONOPS)**
  - **1 hour weathering period after exposure**
  - **2 hour flight at 10,000 feet altitude**
  - **Decontamination procedures conducted in MOPP**
- **Evaluate five decontamination events**
  - **5% Bleach**
  - **DF-100 (foam only one side, scrubbed on other)**
  - **DF-100 (same as above on the other half)**
  - **Hot soapy water**
  - **Thickened simulant event**

Installation Protection Programs

CASPOD

- Demo ops concepts and TTPs to initiate/sustain CB defense ops at SPODs
- Identify/refine force structure to implement procedural/equipment requirements
- Develop/demo resident/pre-positioned or rapidly transportable CB defense equipment and material packages
- Identify strategic/operational improvement/ shortfalls for CASPOD contingencies

CONTAMINATION AVOIDANCE AT SEA PORTS OF DEBARKATION (CASPOD)

MTMC Charleston, SC

Preliminary Demonstration Site

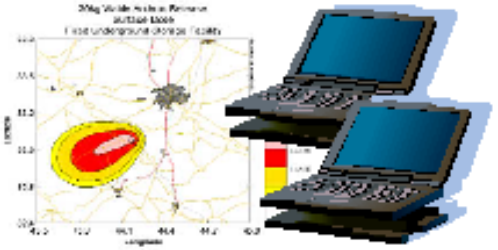
DETECTION

Chemical point detectors

Chemical Remote Detectors

Biological Detectors

SITUATIONAL AWARENESS



DECON

PROTECTION

MEDICAL

Installation Protection Programs

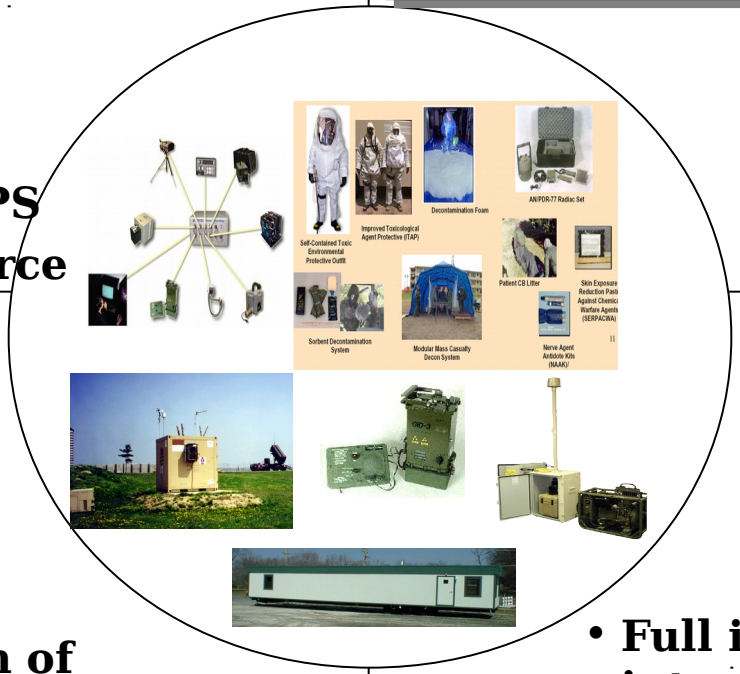
JSIPP

Objectives

- Equip diverse installations
- Provide equip and training
- Help refine CONOPS
- Recommend resource requirements

Tier 1: Emergency Responder equipment, CONOPS refinement & training

- No CB Detection equipment installed


Self-Contained Toxic Environmental Protective Outfit
Improved Toxicological Agent Protective (ITAP)
Decontamination Foam
AN/PDR-77 Radiac Set
Patient CB Litter
Skin Exposure Reduction Paste Against Chemical Warfare Agents (SERPACWA)
Sorbent Decontamination System
Modular Mass Casualty Decon System
Nerve Agent Antidote Kits (NAAK)

Tier 2: ER & limited CB detection equipment, CONOPS refinement & training

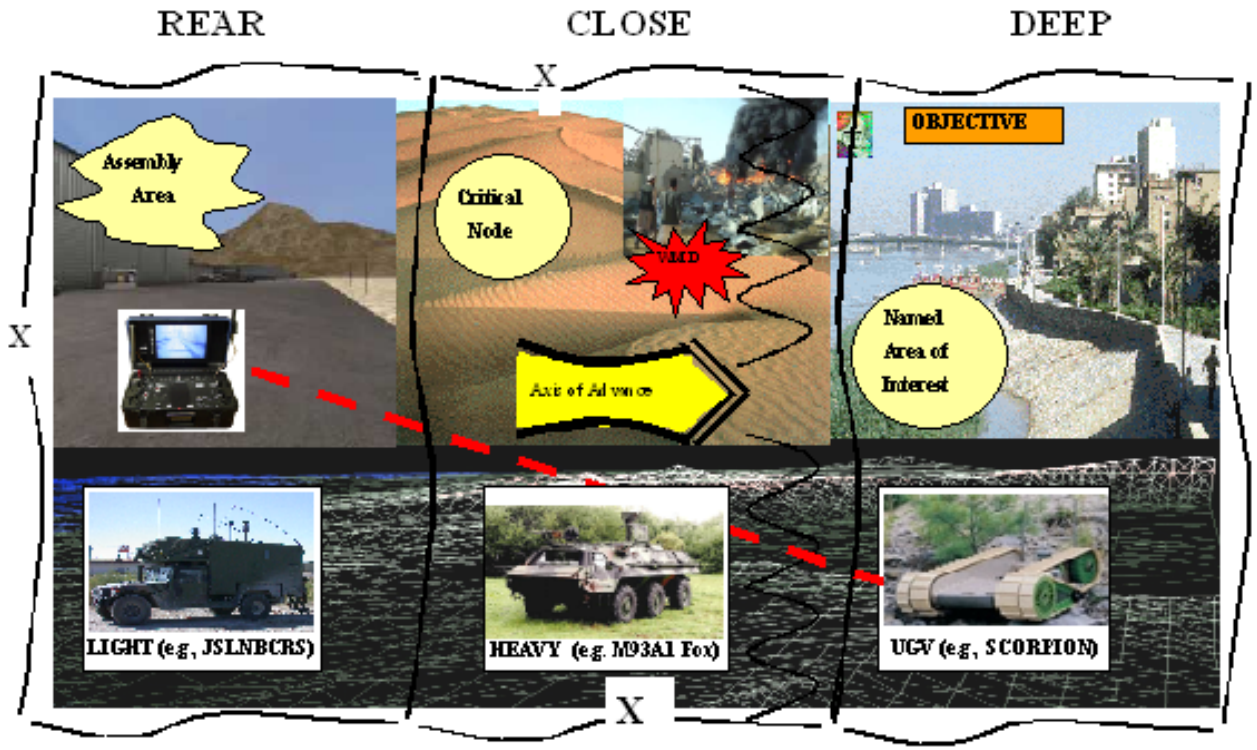
- Limited integration of sensors into existing installation Emergency Response network

Tier 3: ER & CB Detection equipment, integration, CONOPS refinement & training

- Full integration of sensors into existing installation Emergency Response network

CBRN Unmanned Ground Reconnaissance (CUGR) ACTD

FY05 ACTD
Candidate



Demonstrate non-contact Chemical Surface Detection technology in manned and unmanned ground platforms for NBC recon units

Bottom line

- S&T is an integral member of the CBDP team
- Building the S&T team

must get quality products to our warfighters - - - quic